

ABSTRACT OF THE DISCLOSURE

To reduce the magnetic flux leakage through the gap between magnetic pole teeth of an armature so as to reduce the magnetic attraction force generated between the armature and a needle, an armature unit is provided with two magnetic poles 1 and 2, on the top of which are magnetic pole teeth 11a, 12b, 21b, and 22a protruding toward the opposing magnetic pole, where the magnetic pole teeth of the magnetic pole 1 are arranged at two heights, upper and lower, and the magnetic pole teeth of the opposing magnetic pole 2 are arranged at two heights, upper and lower, so that the magnetic flux flows upward and downward alternately between the upper and lower magnetic pole teeth. The needle 6 equipped with permanent magnets moves relatively in the gap 8 between the upper and lower magnetic pole surfaces of the armature unit.